



WMSC Commissioner Brief: W-0271 – Collision – Alexandria Rail Yard – July 21, 2023

Prepared for Washington Metrorail Safety Commission meeting on April 9, 2024

Safety event summary:

A Roadway Maintenance Machine consist collided with an employee's personal car at a grade crossing in the Alexandria Rail Yard at approximately 6:03 a.m. on July 21, 2023.

At 5:59 a.m., the Equipment Operator and Flagman on the RMM consist – Prime Mover 37 pushing Flatcar F523 – received an absolute block from the interlocking operator for movement back into the rail yard after overnight work activities elsewhere in the rail system. The consist was delayed in returning to the yard due to a brake issue on the flatcar that was repaired in the field. This led to the consist returning to the yard after the start of passenger service and at the time of the shift change, rather than the normal time approximately 1 hour earlier when there are typically far fewer vehicles driving over the grade crossing.

The Equipment Operator stopped prior to the grade crossing. Multiple employees were driving personal cars in and out of the rail yard through the highway portion of the grade crossing due to the 6 a.m. shift change. Metrorail rules give rail vehicles the right of way at yard grade crossings, but the Equipment Operator stated that they remained stopped due to the traffic.

After the last personal vehicle in the line of cars passed the crossing, the Flagman signaled the Equipment Operator to proceed. As the consist moved forward, another employee in a personal vehicle drove from a parking lot area toward the crossing, did not stop at the stop sign (or associated pavement markings), then entered the grade crossing. The employee stopped their car in the crossing just before it was struck by the Flatcar. The employee in the car was transported to the hospital by the Alexandria Fire Department. The front left side of the car was damaged.

Probable Cause:

The probable cause of this event was a Metrorail employee not following motor vehicle operating requirements in a rail yard.

Corrective Actions:

Metrorail issued a Safety Bulletin on grade crossing safety.

Metrorail is improving signage at its rail yard grade crossings (Metrorail does not have mainline grade crossings) that reminds drivers to yield to trains, and identifies that a horn can indicate vehicle movement.

WMSC staff observations:

The WMSC's inspections have followed up on the durability of these improvements. On February 15, 2024, the WMSC identified the stop sign and associated signage at Greenbelt Yard were lying on the ground, apparently having been knocked down. In accordance with the WMSC Program Standard, the WMSC communicated this hazard to Metrorail to be addressed, along with other items identified during that inspection of Greenbelt Station, Greenbelt Rail Yard, and the path employees use between the two locations.



Washington Metropolitan Area Transit Authority
Department of Safety (SAFE)
Office of Safety Investigations (OSI)

FINAL REPORT OF INVESTIGATION A&I E23505

Date of Event:	July 21, 2023
Type of Event:	A-3: Collision
Incident Time:	06:04 hours
Location:	Alexandria Yard (C99)
Time and How received by SAFE:	06:11 hours MAC Desk
WMSC Notification Time:	07:00 hours
Responding Safety Officers:	OEP, OSI
Rail Vehicle:	PM37 & Flatcar F523
Injuries:	Yes, automobile driver.
Damage:	Moderate damage to the automobile
Emergency Responders:	Alexandria Fire Department
SMS I/A Number	20230721#110090

Alexandria Yard – Collision

July 21, 2023

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Abbreviations and Acronyms

AIMS	Advanced Information Management System
AOM	Assistant Operations Manager
ARS	Audio Recording System
CAP	Corrective Action Plan
CCTV	Closed-Circuit Television
MAC	Mission Assurance Coordinator
MSRPH	Metrorail Safety Rules and Procedures Handbook
NOAA	National Oceanic and Atmospheric Administration
OEP	Office of Emergency Preparedness
OSI	Office of Safety Investigations
PM	Primer Mover
RTC	Rail Traffic Controller
RTRA	Office of Rail Transportation
ROCC	Rail Operations Control Center
SAFE	Department of Safety
S & I	Service & Inspection
SMS	Safety Measurement System
TRST	Office of Track and Structures
WMATA	Washington Metropolitan Area Transit Authority
WMSC	Washington Metrorail Safety Commission

**Washington Metropolitan Area Transit Authority
Department of Safety – Office of Safety Investigations**

Executive Summary

Note that all times listed are approximate and may contain minor variations due to differences between systems of record

On July 21, 2023, at 05:59 hours, the Alexandria Yard Tower issued Prime Mover (PM) 37 an absolute block to proceed past Signal C99-146 as they were returning to the Yard from their overnight work assignment. PM37 was pushing flatcar F523 as it approached the grade crossing, near the Service and Inspection (S&I) building. As they approached the grade crossing, PM37, which had a Flagman positioned at the front of the Flatcar, came to a stop prior to proceeding through the crossing. At the same time, multiple automobiles were entering and exiting the yard, using the grade crossing, due to the shift change that was taking place at 06:00 hours.

The Flagman signaled the Equipment Operator to proceed after the last vehicle had passed. As PM37 moved towards the grade crossing, an employee exited the employee parking area in their personal vehicle and approached the same crossing. The grade crossing was regulated by a stop sign for vehicular traffic.

As PM37 was beginning to traverse the crossing, the employee attempted to cross without coming to a complete stop. The employee stopped their automobile in front of flatcar F5230, which was now in the crossing, resulting in a collision. Initially, there were no injuries reported, but the employee in the automobile later reported being injured, prompting the dispatch of Alexandria Fire & EMS to the scene.

The probable cause for the Collision at Alexandria Yard on July 21, 2023, was the employee's failure to adhere to signage and pavement markings regulating the grade crossing. The employee did not come to a stop before entering the crossing and failed to yield to the rail vehicle, resulting in their vehicle being positioned directly in front of PM37, which was already in motion.

Incident Site

Fixed grade crossing in front of the Alexandria Yard Service and Inspection shop with standard stop signs.

Field Sketch/Schematics



The above depiction is not to scale.

Purpose and Scope

The purpose of this accident investigation and candid self-evaluation is to collect and analyze available facts, determine the probable cause(s) of the incident, identify contributing factors, and make recommendations to prevent a recurrence.

Investigative Methods

The investigative methodologies included the following:

- Physical Site Assessment
- Formal Interviews – SAFE interviewed two individuals as part of this investigation. Interview included persons present at, during, and after the incident, those directly involved in the response process, and representatives from the Washington Metrorail Safety Commission (WMSC). SAFE interviewed the following individuals:
 - Equipment Operator
 - Flagman
- Documentation Review – Collection of relevant work history information and process documentation contained in WMATA systems of record. These records include:
 - Equipment Operator & Flagman Training Records
 - Equipment Operator & Flagman 30-Day work history review
 - Metrorail Safety Rules and Procedures Handbook (MSRPH)
 - National Oceanic and Atmospheric Administration (NOAA)
 - Rail Operations Control Center (ROCC) Incident Report
- System Data Recording Review – Collection of information contained in Metro Data Recording Systems. This data includes:

- ARS (Audio Recording System) playback [Radio and Landline Communications]
- Closed-Circuit Television (CCTV)

Investigation

On May 21, 2023, at 05:59 hours, the Alexandria Yard Tower issued PM37 an absolute block to clear Signal C99-146 as they returned to the Yard from their night assignment. PM37 was pushing flatcar F523 in the reverse as they approached the grade crossing into the Yard near the Alexandria Service & Inspection (S&I) Shop. Before reaching the grade crossing, PM37 stopped due to traffic caused by shift change.

The Equipment Operator said there's typically not that much traffic at the grade crossing, but that morning they were delayed and were entering the Yard during a shift change. CCTV confirmed there was moderate traffic due to the shift change. Once the Tower gave them an absolute block, the Flagman gave the Equipment Operator the hand signal to proceed using their flashlight after waiting for the line of vehicles to clear. As PM37 proceeded toward the grade crossing, an employee exited the S & I Shop employee parking lot in their personal vehicle and approached the grade crossing. There is a stop sign that governs vehicular traffic flow at the grade crossing. The employee did not come to a stop before proceeding to cross the grade crossing.

CCTV indicated that PM37 was already traversing the grade crossing when the employee abruptly tried to cross but stopped directly in front of PM37, resulting in the collision. Initially, there were no reported injuries. While still on the scene, the employee who was in the automobile reported being injured. The ROCC Assistant Operations Manager (AOM) contacted the Alexandria Fire & EMS to be dispatched to the scene. At 06:49 hours, Alexandria EMS transported the injured employee to a medical facility.

Chronological Event Timeline

A review of ARS playback, i.e., phone and radio communications, revealed the following timeline:

Time	Description
05:46:32 hours	<u>Interlocking Operator</u> : Gave PM37 an absolute block no closer than 10 feet to the C99-146 signal. [Alex Yard 1]
05:46:44 hours	<u>PM37</u> : Gave a repeat back. [Alex Yard 1]
05:50:03 hours	<u>Interlocking Operator</u> : Instructed PM37 to clear the C99-150 signal so they could get the trains out of the yard. [Alex Yard 1]
05:59:15 hours	<u>Interlocking Operator</u> : Advised PM37 to verify C99-150 signal lunar and gave an absolute block to clear the C99-146 signal. [Alex Yard 1]
06:03:00 hours	<i>PM37 made contact to the adverse vehicle. [CCTV]</i>
06:03:56 hours	<u>Equipment Operator</u> : Informed the Tower that a car drove in front of the unit. [Alex Yard 1]
06:04:09 hours	<u>Interlocking Operator</u> : Contacted the Ops. 3 Buttons RTC to inform them of the collision in Alexandria Yard with PM37 and an employee's personal vehicle. [Ops. 3 Phone]
06:04:14 hours	<u>Interlocking Operator</u> : Asked the Equipment Operator if they made contact with the car. <u>Equipment Operator</u> : Confirmed they made contact to the automobile. [Alex Yard 1]

Time	Description
06:06:56 hours	<u>Interlocking Operator</u> : Asked the Equipment Operator if medical assistance was needed. <u>Equipment Operator</u> : Responded that they needed SAFE and Transit at the scene. <u>Flagman</u> : Responded that the driver looked fine. [Alex Yard 1]
06:07:56 hours	<u>Buttons RTC</u> : Contacted the ROCC AOM to inform them of the collision at Alexandria Yard; no medical assistance was requested. [Ops. 3 Phone]
06:15:18 hours	<u>Buttons RTC</u> : Received a call from the Interlocking Operator requesting medical assistance. [Ops. 3 Phone]
06:18:04 hours	<u>MAC</u> : Contacted the Safety Director On-Call to inform them of the collision at Alexandria Yard. [MAC Desk]
06:19:30 hours	<u>ROCC AOM</u> : Contacted the Alexandria Fire Department to request medical assistance at Alexandria Yard. [Rail 2]
06:19:33 hours	<u>MAC</u> : Contacted the Director of Safety Investigations to inform them of the collision and asked for personnel to respond to the scene. [MAC Desk]
06:20:43 hours	<u>Buttons RTC</u> : Contacted the Interlocking Operator to inquire about the injuries that were sustained. [Rail 2]
06:23:24 hours	<u>Director of Response and Recovery</u> : Contacted the MAC to inquire about the response time from the Tower reporting the incident and the communication between parties. [MAC Desk]
06:30:00 hours	Alexandria FD arrived on the scene. [CCTV]
06:35:14 hours	<u>MAC</u> : Contacted the WMSC to inform them of the collision at Alexandria Yard and obtained an Event Scene Release. [MAC Desk]
06:49:00 hours	Alexandria EMS leaves the scene with the injured employee. [CCTV]
06:52:00 hours	All Alexandria emergency personnel cleared the scene. [CCTV]
07:16:00 hours	WMATA staff removed the injured employee's vehicle from the grade crossing. [CCTV]
07:20:00 hours	PM37 was removed from the scene. [CCTV]
07:23:04 hours	<u>Buttons RTC</u> : Contacted the RTRA Supervisor to get an update on the status of the involved parties and the reported injury. [Ops. 3 Phone]
07:59:05 hours	<u>RTRA Supervisor</u> : Contacted the Buttons RTC to provide an update on the collision and the information of the involved personnel. [Ops. 3 Phone]

****Note:** Times above may vary from other systems' timelines based on clock settings and reporting sources.

Closed-Circuit Television (CCTV)

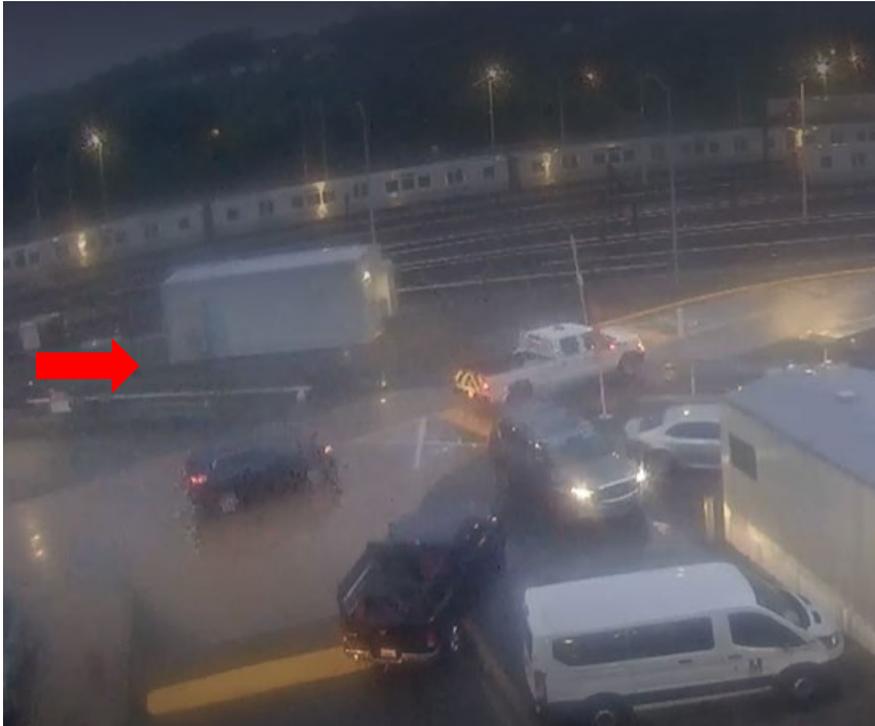


Figure 1: This image shows cars leaving the Yard after a shift change as PM37 was stopped. The red arrow shows the direction PMM37 was approaching.



Figure 2: This image shows PM37 moving towards the grade crossing as the two vehicles cleared the crossing. The circled vehicle is the vehicle involved in the collision.

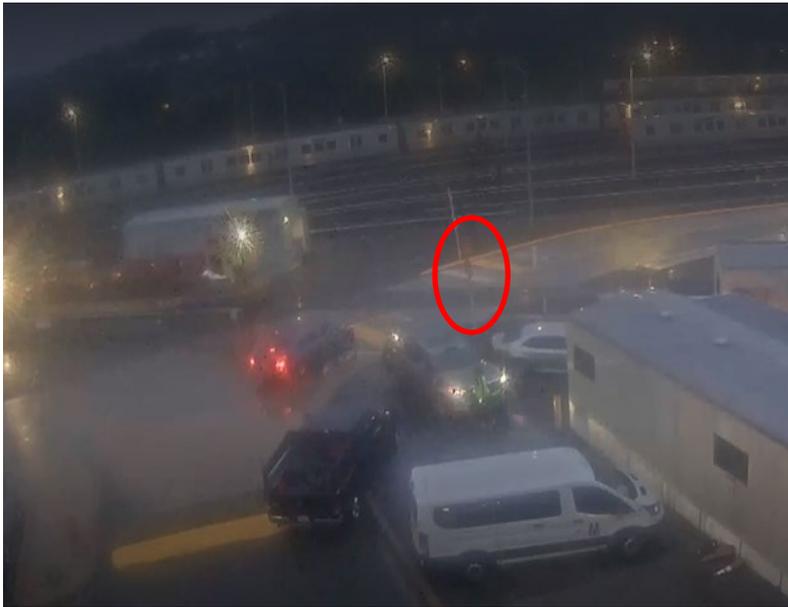


Figure 3: This image shows PM37 beginning to traverse the grade crossing when the vehicle approached the stop sign. The red circle shows where the stop sign is located.



Figure 4: The vehicle appeared to stop directly in the path of PM37 and never made a complete stop at the stop sign.

Interview Findings

As part of the investigation launched into the event, SAFE interviewed two people. The interviews identified the following key findings associated with this event. Findings detailed below include reported information from involved personnel and may conflict with other data sources contained in the report.

Equipment Operator

During the interview, the Equipment Operator, who has 1.5 years of experience in the role, provided the following:

- They were returning to Alexandria Yard after completing the task of dropping off and picking up rail from the last shutdown area.
- There were no mechanical issues with the equipment during their operation.
- The entry into the Yard was delayed due to other trains departing for revenue service.
- They utilized radio communications to interact with the flagman.
- The Equipment Operator expressed confusion about why the car in front of them suddenly pulled out and stopped, leading to the collision.

Flagman

During the interview, the Flagman, who has 9.5 years of experience in the role, provided the following:

- They were standing on the flatcar that was being pushed by PM37.
- While on the job site, the flatcar experienced an issue with the dump valve, and a mechanic was dispatched to the location to resolve the issue.
- This did not affect the operations of the unit.
- This caused them to be delayed returning to Alexandria Yard.
- When they approached the grade crossing, they stopped because there was traffic due to a shift change.
- The Interlocking Operator gave them an absolute block, the Equipment Operator sounded the horn, and they gave the Equipment Operator the proceed signal.
- After contact was made, they asked the employee if they were injured. At that time, the employee said no but later claimed injury.

Automobile Driver (WMATA Employee)

SAFE was unable to interview the motorist that was operating their personal vehicle. The employee has not returned to work since the collision.

Weather

On July 21, 2023, at the time of the incident, NOAA recorded the temperature as 69.8°F, with clear skies, winds of 4 mph, and 88.37% humidity. The weather did not contribute to this incident (Weather source: NOAA) – Location: Alexandria, VA.

Related Rules and Procedures

MSRPH 3.92: At all roadway crossings in yards, rail vehicle operators shall bring their vehicles to a stop and shall sound their horns before crossing.

Human Factors

Evidence of Fatigue

Equipment Operator

We evaluated conditions at the time of the incident to distinguish whether evidence of fatigue was present. No video of the involved person was available to ascertain whether evidence of fatigue was present. The Equipment Operator reported feeling fully alert at the time of the incident. The Equipment Operator reported experiencing no symptoms of fatigue in the time leading up to the incident.

Flagman

SAFE evaluated conditions at the time of the incident to distinguish whether evidence of fatigue was present. No video of the involved person was available to ascertain whether evidence of fatigue was present. The Flagman reported feeling fully alert at the time of the incident. The Flagman reported experiencing no symptoms of fatigue in the time leading up to the incident.

Fatigue Risk

Equipment Operator

SAFE evaluated incident data for fatigue risk factors. No significant risk was identified. The incident time of day did not suggest an increased risk of fatigue-related impairment. The Equipment Operator reported keeping a regular sleep schedule in the days leading up to the incident. The Equipment Operator worked the 22:00 – 06:00 hours shift in the days leading up to the incident. The Equipment Operator was awake for 9 hours at the time of the incident. The Equipment Operator reported 9 hours of sleep in the 24 hours preceding the incident. The off-duty period was 16 hours, providing an opportunity for 7-9 hours of sleep. This was a comparable amount of sleep as the Equipment Operator's usual workday sleep durations. The Equipment Operator reported no issues with sleep.

Flagman

SAFE evaluated incident data for fatigue risk factors. No significant risk was identified. The incident time of day did not suggest an increased risk of fatigue-related impairment. The Flagman reported keeping a regular sleep schedule in the days leading up to the incident. The Flagman worked the 22:00 – 06:00 hours shift in the days leading up to the incident. The Flagman was awake for 9 hours at the time of the incident. The Flagman reported 8 hours of sleep in the 24 hours preceding the incident. The off-duty period was 16 hours, providing an opportunity for 7-9 hours of sleep. This was a comparable amount of sleep as the Flagman's usual workday sleep durations. The Flagman reported no issues with sleep.

Post-Incident Toxicology Testing

WMATA's Drug and Alcohol Program determined that the Equipment Operator and Flagman complied with the Drug and Alcohol Policy and Testing Program 7.7.3/6.

Findings

- PM37 was returning to Alexandria Yard following their night assignment.
- The entry of PM37 into the Yard was delayed due to revenue trains exiting the yard.
- The event occurred during shift change.
- The grade crossing is governed by a stop sign and pavement markings.
- The motorist involved in the collision failed to come to a complete stop at the stop sign and failed to yield to the rail vehicle.
- The motorist initially did not request medical attention after the collision.
- Moderate damage was observed on the driver-side door of the motorist's vehicle.

Immediate Mitigation to Prevent Recurrence

- Conducted post-incident testing for the Equipment Operator and Flagman who were involved in the incident.
- Removed PM37 from service for incident testing to assess any potential issues or malfunctions related to the equipment.
- The WMATA employee was transported to a local hospital.

Probable Cause Statement

The probable cause for the Collision at Alexandria Yard on July 21, 2023, was the employee's failure to adhere to signage and pavement markings regulating the grade crossing. The employee did not come to a stop before entering the crossing and failed to yield to the rail vehicle, resulting in their vehicle being positioned directly in front of PM37, which was already in motion.

Recommended Corrective Actions

Corrective Action Code	Description	Responsible Party	Estimated Completion Date
105349_SAFE CAPS_SAFE_ 002	Work with the Office of Safety Risk Management and/or the Office of Operating Practices to develop signage to be placed at all rail yard crossings that will advise motor vehicle drivers to be on the lookout for train movement at all times and in any direction with an emphasis on horn activation may be an indication of possible train movement.	SAFE	Completed
110090_SAFE CAPS_SAFE_ 001	Issue a Safety Bulletin to all staff regarding Grade Crossing safety.	SAFE	Completed

Appendices

Appendix A – Interview Summaries

The below narratives summarize the incident and represent the statements made by the involved individual. As such, times and details may present a conflict with the data contained in systems of record.

Equipment Operator

The Equipment Operator is a WMATA employee with 1.5 years of experience, all as an Equipment Operator. The Equipment Operator is RWP Level 2 certified and must recertify in March 2024. The Equipment Operator mentioned feeling fully alert while operating PM37 back to Alexandria Yard. The Equipment Operator said they attended a Roadway Job Safety Briefing before leaving the Yard. The Equipment Operator said their assignment for the night was to transport new rail and pick up the old rail from the last shutdown site. The Equipment Operator said they mainly operate the Prime Movers, but there are other units they are certified to operate. The Equipment Operator said they were delayed a little over an hour entering the Yard because trains were pulling out for revenue service.

The Equipment Operator said they were using their handheld radio and had to communicate on three radio Ops. due to traveling through three different regions to their work site. The Equipment Operator said there typically isn't that much traffic at the grade crossing but it was higher than normal because it was during a shift change. The Equipment Operator said they were communicating with the Flagman via radio. The Equipment Operator said they came to a complete stop at the grade crossing because it was heavy traffic. They said when the Tower gave them an absolute block, the Flagman gave them the signal to proceed. When they were halfway through the crossing, they noticed the car trying to clear the grade crossing and stopped in front of the PM but contact was made.

Flagman

The Flagman is a WMATA employee with 9.5 years of experience, all as an Equipment Operator. The Flagman is RWP Level 4 certified and must recertify in February 2024. The Flagman mentioned feeling fully alert while in standing on the flatcar that PM37 was pushing back to Alexandria Yard. The Flagman said their role is to alert the Equipment Operator of any roadway obstructions and ensure switches are in the proper alignment. The Flagman serves as an Equipment Operator as well. The Flagman said their assignment for the night was to transport new rail and pick up the old rail from the last shutdown site. The Flagman said they attended a Roadway Job Safety Briefing before leaving the Yard. The Flagman said the flatcar had an issue with the dump valve while at the job site. A mechanic came to the location and resolved the issue with the air leak. The Flagman said this caused a delay in their return to Alexandria Yard.

The Flagman said they had to communicate on three different radio Ops, due to traveling through three different regions to their work site. They said when the Interlocking Operator gave them an absolute block, they were at a complete stop because cars was crossing the grade crossing. At the last car, they said the Equipment Operator sounded their horn and proceeded once they gave them the proceed signal. As they were crossing, they said the car came out of nowhere and tried to cross in front of the PM. The Flagman said that after contact was made, they asked the employee if they were okay. They said the employee rolled down the window and said yeah, but they stayed in the car.

Appendix B – Photographs



Figure 5: This image shows the point of contact.

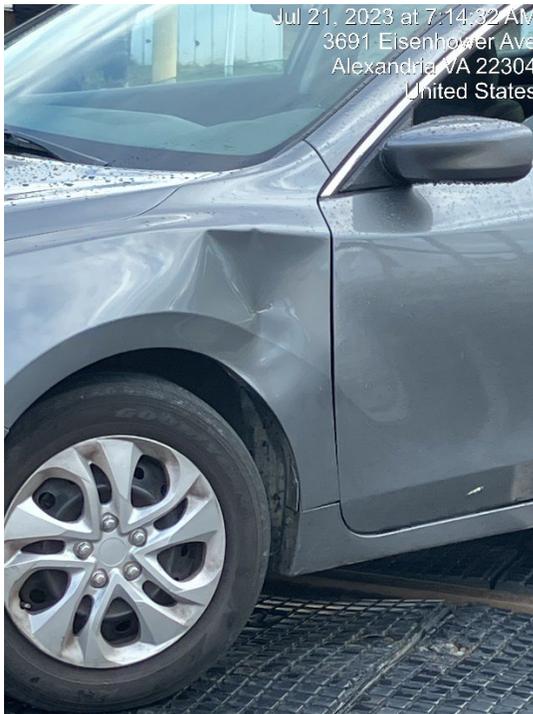


Figure 6: This image shows the damage caused from the impact.



Figure 7: This image shows the updated signage as you enter Alexandria Yard outside of the S & I Shop.



Figure 8: This image shows the updated signage and pavement markings as you exit the Alexandria Yard, which was the direction of travel during this event.

Appendix C – Maximo Work Order



Washington Metropolitan Area Transit Authority Maintenance and Material Management System Work Order Details

Page 1 of 1
MX76PROD

Work Order #: 18020553
Type: SPIN



Status: CLOSE
08/01/2023 09:47

Work Description: Post Incident Inspection
Job Plan Description:

Supervisor: [REDACTED] did the inspection.

		Work Information	
Asset: MPM37	PM37, PRIME MOVER, HARSCO, 354C, S/ N 6100751, 4	Owning Office: CTEM	Parent:
Asset Tag: MPM37		Maintenance Office: CTEM-ALEX-HVYR	Create Date: 07/21/2023 12:55
Asset S/N: 6100751		Labor Group: CTEM-ALEX-HVYR	Actual Start: 07/21/2023 13:00
Location: 1213	C99, ALEXANDRIA YARD	Crew:	Actual Comp: 07/26/2023 10:51
Work Location: 13937	C93, ALEXANDRIA YARD, BUILDING (C) PLNT, 1ST FLOOR RAIL SECTION, CTEM SHOP	Lead:	Item: CTEM49200006
Failure Class: CTEM001	GENERAL	GL Account: WMATA-02-33380-50499070-041-*****-OPR**	
Problem Code: 2907	SAFETY INSPECTION	Supervisor: [REDACTED]	Target Start:
Requested By:		Requestor Phone: 443/624-1894	Target Comp:
			Scheduled Start:
Create-Mileage: 0.0		Complete-Mileage: 0.0	

Task IDs

Task ID	Description
10	Post incident Inspection
No discrepancies found, refer to the post incident inspection form attached.	
000-400 CTEM-CAR TRACK EQUIPMENT (NON-	
Component: REVENUE VEHICLES)	Work Accom: INSPECTED Reason: INSPECTION Status: CLOSE Position: Warranty?: N

Measurements										
Asset	Description	Asset Position	Measurement Point Description	Before Meas	After Meas	Last Meas	Last Meas Date	LL	UL	UNIT
923615	DIESEL ENGINE, DETROIT SERIES 60, HARSCO 354C		CTEM ASSET RUN HOURS		7586.00	7508.00	7/6/23 24:00	-2.000	1000000.0	HOUR

Failure Reporting			
Cause	Remedy	Supervisor	Remark Date
3432 PERFORMED SAFETY INSPECTION	4057 TESTED / INSPECTED / CERTIFIED	[REDACTED]	07/26/2023
Remarks: Unit ready for service.			

Incident Date: 07/21/2023 Time: 06:04 hours
Final Report – Collision. Rev. 1
E23505

Drafted By: SAFE 703 09/15/2023
Reviewed By: SAFE 71 – 09/19/2023
Approved By: SAFE 71 09/19/2023



Washington Metropolitan Area Transit Authority
Maintenance and Material Management System

Work Order Details

Work Order #: 18018864
Type: CM



Status: CLOSE
07/24/2023 08:27

Work Description: Dump valve broken off the A- End
Job Plan Description:

Work Information

Asset: MF523	CTEM, FLAT CAR, S/N F523	Owning Office: TRST-TRAK-ALEX	Parent:
Asset Tag: MF523		Maintenance Office: CTEM-NCAR-HVYR	Create Date: 07/21/2023 04:32
Asset SIN: F523		Labor Group: CTEM-NCAR-HVY	Actual Start: 07/21/2023 04:54
Location: 1230	D99, NEW CARROLLTON YARD	Crew:	Actual Comp: 07/21/2023 13:22
Work Location: 13937	C93, ALEXANDRIA YARD, BUILDING (C) PLNT, 1ST FLOOR RAIL SECTION, CTEM SHOP	Lead:	Item: CTEM49200003
Failure Class: CTEM008	PNEUMATIC	GL Account: WMATA-02-33391-50499160-041-*****-OPR**	
Problem Code: 2184	LEAKING AIR	Supervisor: [REDACTED]	Target Start:
Requested By:		Requestor Phone:	Target Comp:
Chain Mark Start:		Chain Mark End:	Scheduled Start:
Create-Mileage: 0.0		Complete-Mileage: 0.0	

Task IDs

Task ID	Description	Component	Work Accomplishment	Reason	Status	Position	Warranty?
10	Plugged Dump valve broken off the A- End Dump valve broken off the A- End, Plugged	000-400-CHA-080 CHASSIS, STEP/ STAIR	RECOVERED	IMPROVED RELIABILITY	CLOSE		N
20	REPLACED BROKEN EMERGENCY DUMP VALVE PIPE	000-400-CHA-080 CHASSIS, STEP/ STAIR	REPLACED NEW	BROKEN	CLOSE		N

Actual Labor

Task ID	Labor	Start Date	End Date	Start Time	End Time	Approved?	Regular Hours	Premium Hours	Line Cost
10	[REDACTED]	07/21/2023	07/21/2023	03:00	06:00	Y	03:00	00:00	\$126.42
10	[REDACTED]	07/21/2023	07/21/2023	03:00	06:00	Y	03:00	00:00	\$151.33
20	[REDACTED]	07/21/2023	07/21/2023	09:00	12:30	Y	03:30	00:00	\$174.03
Total Actual Hour/Labor:							09:30	00:00	\$451.78

Failure Reporting

Cause	Remedy	Supervisor	Remark Date
2671 PHYSICAL DAMAGE	0004 REPLACED	[REDACTED]	07/21/2023

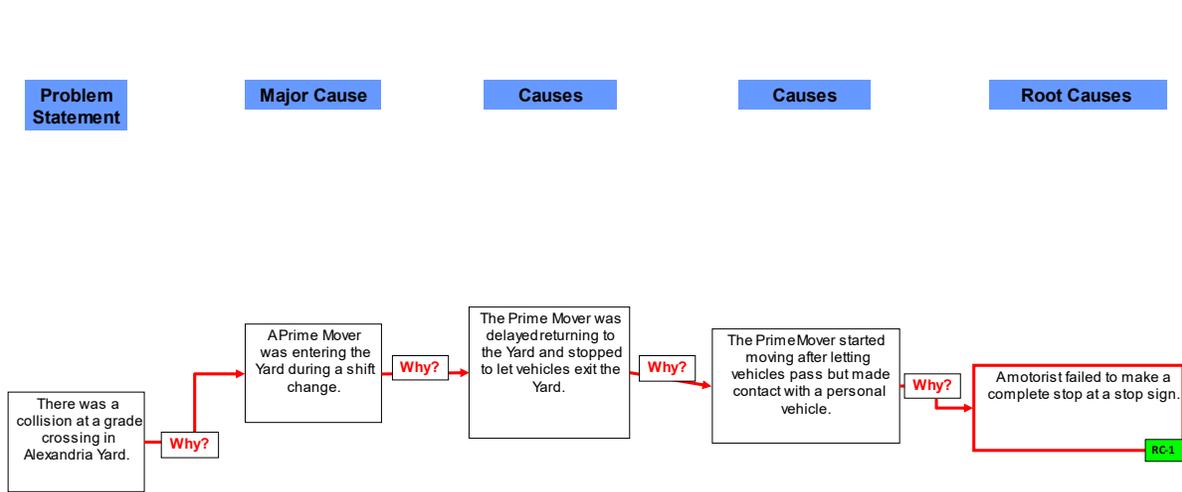
WT_plust_woprnt.rptdesign

09/19/2023 13:19

Incident Date: 07/21/2023 Time: 06:04 hours
Final Report – Collision. Rev. 1
E23505

Drafted By: SAFE 703 09/15/2023
Reviewed By: SAFE 71 – 09/19/2023
Approved By: SAFE 71 09/19/2023

Appendix D – Why-Tree Analysis



Root Cause Analysis

